



Los Angeles Unified School District

**INTENSIVE SUPPORT AND INNOVATION CENTER**

*"We innovate and transform learning to inspire excellence."*

## Elementary Professional Development Center

### Math: Menu of Services

The following Menu of Services will build upon the framework of lesson design developed over the 3-day PD center work, as well as support our larger ESC goals. These services outlined here will be provided direct to schools, through bank-time, lesson study, PLC work, grade-level planning, and/or focused on-site efforts.

These services are based on the following four research-based principles outlined in the NSDC's Report ["Professional Learning in the Learning Profession: A Status Report on Teacher Development in the United States and Abroad"](#) (Darling-Hammond 2009): 1) PD should be **intensive, ongoing, and connected to practice**; 2) PD should focus on student learning and address the teaching of specific content; 3) PD should align with school improvement priorities and goals; and 4) PD should build strong working relationships among teachers.

In addition these PD services were designed to be in alignment with the following four professional development principles from the recently released report by the Center for Public Education titled ["Teaching the Teachers: Effective Professional Development in an Era of High Stakes Accountability"](#) which follow: 1) **The duration of professional development must be significant and ongoing to allow time for teachers to learn a new strategy and grapple with the implementation problem**; 2) **There must be support for a teacher during the implementation stage that addresses the specific challenge of changing classroom practice**; 3) **Teachers' initial exposure to a concept should not be passive, but rather should engage teachers through varied approaches so they can participate actively in making sense of a new practice**; 4) **Modeling has been found to be highly effective way to introduce a new concept and help teachers understand a new practice**.

Thus the ISIC Math Menu of Services is presented below as a Professional Development Series of connected PD experiences spread over time to allow for implementation and reflection in-between connected PD experiences in order to allow teachers opportunities to practice and receive feedback from an instructional coach/CCSS Math Expert or their PLC before moving forward with the next PD experience in the series of connected PDs. PD experiences in a series could be spaced out anywhere from 1 week to 4 weeks to allow for teacher implementation and feedback.

The professional development plan for each school site will be based on individual school needs determined by instructional rounds, ISIC's Common Core strategic plan, and principal/director discretion. Please note that the following Professional Development Series will be adapted to your individual school needs. These are not intended to be one-time isolated PD offerings; instead, they will be delivered and implementation support will be provided in a variety of forms over time. Finally all of these PD Series will not nor can they be delivered in one year at a school site; maybe 1 or 2 PD series are selected for one year at one school site with follow-up for the rest of the year to refine/revise the implementation of this new learning.



## Math Professional Development Series

Professional Development Series Title	Connected PD Sessions <sub>3</sub>	Description
<p><b>LAUSD Plan, Deliver, Reflect, Revise /Refine Toolkit<sub>1</sub></b></p> <p>Teaching &amp; Learning Framework Connections:  <a href="#">1a2, 1d1, 1d4, 1e2, 1e3, 1e4</a>  <a href="#">3b1, 3b2, 3c1, 3d3</a></p> <p>Math Shifts Connections:  <a href="#">Focus</a>  <a href="#">Coherence</a>  <a href="#">Rigor</a></p> <p>Math Practice Connections:  <a href="#">SMPs 1-8</a></p> <p>Special Population Connections:  <a href="#">ELLs</a>  <a href="#">SWDs</a>  <a href="#">SELS</a></p>	<p>1) Deconstruct Performance Task  <b>2 hr Bank Time + Staff</b>  <b>2 hr (K-2 each)</b>  <b>2 hr (3-5 each)</b></p>	<p>PD will include using the LAUSD Toolkit section Deconstructing Periodic Assessment Protocol. The CA Math Framework, CCSSM, and the University of Arizona CCSS Math Learning Progressions will be used to deconstruct the LAUSD math performance tasks in the district periodic assessments.</p>
	<p>2) Plan a Unit using UbD  <b>1 day per grade level</b></p> <p><b>After Experience Designing UBD Unit:</b>  <b>2 hr per grade level (K-2)</b>  <b>2 hr per grade level (3-5 each)</b></p>	<p>In this PD participants will become familiar with the Understanding By Design (UbD) Framework in the process of cognitively planning a unit. PD will include grade level team planning a coherent instructional sequence using the LAUSD Curriculum Maps and with a focus on a Critical Area/SBAC Target in that particular grade level. The unit will include a mid and end of unit formative assessment. The unit should address the focus standards of the upcoming periodic assessment. This PD could be a precursor to a Lesson Study Cycle using one of the lessons within the unit.</p>
	<p>3) Reflect: Analyze Student Work  <b>2 hr Bank + Staff</b>  <b>2 hr per grade level (K-2 each)</b>  <b>2 hr per grade level (3-5 each)</b></p>	<p>PD will use the LAUSD Toolkit section Reflect. Teacher will learn how to analyze student work collaboratively using a modified version of the ATLAS protocol and use a protocol to score their students' work individually and collaboratively. This is an example of PLC work.</p>
	<p>4) Revise and Refine Unit  <b>2 hr Bank + Staff</b>  <b>2 hr (K-2 each)</b>  <b>2 hr (3-5 each)</b></p>	<p>PD will use the LAUSD Toolkit section Refine/Revise. Teachers will employ the use of the tuning protocol for revising and refining the unit. Teachers will then revise the unit for future delivery of instruction.</p>

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<p><b>Math Classroom Discourse<sub>1</sub></b></p> <p>Teaching &amp; Learning Framework Connections: 2a, 2b, 2c,, 3c1, 3b1, 3b2</p> <p>Math Shifts Connections:</p> <p>Math Practice Connections: SMPs 1-8</p> <p>Special Population Connections: ELLs SWDs SELs</p>	<p>1) Building Blocks for Generating Math Talk in the Math Classroom + Follow Up  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will start with conversation norms to create a safe environment. Basic talk moves will be introduced/reviewed to move a classroom from a silent classroom to one where math talk is occurring. Teachers will then be introduced to conversation skills from Jeff Zwiers, which seek to move students beyond a brief academic exchange to an academic discourse conversation with multiple exchanges and a building and finally fortifying of math ideas and concepts.</p>
	<p>2) Art of Questioning &amp; Using Student Thinking to Propel Discussions. + Follow Up  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will introduce the types and purpose of focusing, assessing, and advancing questions to make students' thinking visible and then push their thinking forward in understanding and applying their understanding of math concepts and ideas. Teachers will also learn how to form follow-up questions to student thinking in order to make misconceptions visible and deepen math conceptual and procedural knowledge.</p>
	<p>3) Setting Up a Conducive Environments for Discussion + Follow Up  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will focus on setting up the physical environment in order to enhance student engagement and create a discourse-rich environment. Topic covered will be physical layout, placement of visual aids and math vocabulary world walls, use of sentence frames, different ways of organizing students to think talk, and write (Gallery Walk, Board Writing, &amp; Math Congress)</p>
	<p>4) Orchestrating Productive Math Discussions + Follow Up  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will focus on introducing and modeling the five practices of orchestrating productive math discussions including: 1) Anticipating Student Responses to challenging math tasks 2) Monitoring Student Work on and engagement with the tasks 3) Selecting particular students to present their math solution paths 4) Sequencing student response that will be displayed in a specific order, and 5) Connecting different student responses and Connecting the Responses to Key Mathematical Idea</p>

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<p><b>CCSS Boot Camp<sub>2</sub></b></p> <p>Teaching &amp; Learning Framework Connections:  <a href="#">1a1, 1a1, 1d1, 3c1, 3c3</a></p> <p>Math Shifts Connections:  <a href="#">Focus</a>  <a href="#">Coherence</a>  <a href="#">Rigor</a></p> <p>Math Practice Connections:  <a href="#">SMPs 1-8</a></p> <p>Special Population Connections:  <a href="#">ELLs</a>  <a href="#">SWDs</a>  <a href="#">SELS</a></p>	<p>1) CCSSM Content Standards &amp; Critical Areas &amp; Where to Focus Instruction  <b>2 hrs. Bank Time + Staff</b></p>	<p>PD will provide an overview of the CCSSM Content Standards in terms of how to read them, the structure and organization in K-5. It will also focus on providing teachers with an understanding of where to focus their instructional time in math using the critical areas and the <i>Student Achievement Partner's Where to Focus</i> documents for each grade including the major, supporting, and other clusters.</p>
	<p>2) CCSSM Practice Standards  <b>2 hrs. Bank Time + Staff</b></p>	<p>PD will provide teachers with a deeper look at the Standards for Math Practice (SMPs) including their origins, and include activities, which will allow teachers to engage with, read and process the Math Practices. Teachers will also see videos of the Math Practices in Action and be provided with tools to develop student's proficiency and progress with the SMPs as well as tasks/activities which model and effectively integrate the SMPs.</p>
	<p>3) SMARTER Balanced Assessments (SBAC) + Follow Up  <b>2 hrs. Bank Time + Staff</b>  <b>2hrs. + 2 hrs. Follow-Up</b></p>	<p>PD will provide teachers with an introduction to the SMARTER Balanced Assessment for Math. Teachers will become familiar with the SBAC assessment types, as well as SBAC Claims and Targets for Math. Teachers will engage with several SBAC items for their grade and discuss instructional implications.</p>
	<p>4) Using DOK &amp; Hess' Cognitive Rigor Matrix to increase and align instructional task rigor to the SBAC + Follow-Up  <b>2 hrs. Bank Time + Staff</b>  <b>2hrs. + 2 hrs. Follow-Up</b></p>	<p>PD will provide teachers with an in depth look at Webb's Depth of Knowledge its connections to the SBAC and also Hess' Cognitive Rigor Matrix. SBAC assessment items will be analyzed and teacher will practice identifying the DOK level of a task. Finally teachers will learn how to increase and align Math instructional tasks using DOK and Hess' Cognitive Rigor Matrix in order to vary and increase the rigor of their these tasks so they align with SBAC assessment items.</p>
	<p>5) Vetting Curriculum using the EQuIP Rubric  <b>2 hrs. Bank Time + Staff</b></p>	<p>PD will provide teachers with a close look at the EQuIP Rubric as a tool to vet curriculum so that it is aligned with the CCSSM Standards and Instructional Shifts. Teachers will be provided with exemplar CCSS Math Lessons as measured by the EQuIP Rubric and then practice using the rubric using a lesson they pull from the Internet themselves individually and then in groups.</p>

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<p><b>Teaching Math Through Problem Solving: A Student Centered &amp; Problem-Based Approach to the Math Workshop Model<sub>1</sub></b></p>	<p>1) Building Math Content Knowledge: Doing Math with Rich Math Tasks &amp; Making Connections to CA Framework &amp; CCSS Progressions  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will build teacher content knowledge through engaging teachers in solving rich mathematical tasks in a defined and focused set of mathematical content and practices. Focus domains from which these rich mathematical tasks will come from include: (1) counting and cardinality and number and operations in base ten (grades k-2); 2) operations and algebraic thinking (grades k-5); &amp; (3) number and operations-fractions (grades 3-5). Teachers will also share their solution paths and make connections to the CA Math Framework &amp; AZ CCSS Learning Progression documents.</p>
<p>Teaching &amp; Learning Framework Connections:  <a href="#">1a1, 1a2, 1d1, 1d4, 1e2, 1e3, 1e4</a>  <a href="#">3b1, 3b2, 3c1</a></p> <p>Math Shifts Connections:  <b>Focus</b>  <b>Coherence</b>  <b>Rigor</b></p>	<p>2) Selecting/Designing Rich Math Tasks &amp; Modifying Math Tasks to Increase Cognitive Rigor  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will provide teachers with guidance in engaging students with rigorous math tasks which allow for multiple entry points, multiple solution paths, sustained academic discourse, and maintenance of cognitive demand at a high level. Teachers will learn how to use the Task Analysis Guide in evaluating, selecting, creating, and modifying mathematical tasks to increase their cognitive rigor.</p>
<p>Math Practice Connections:  <a href="#">SMPs 1-8</a></p> <p>Special Population Connections:  <a href="#">ELLs</a>  <a href="#">SWDs</a>  <a href="#">SELs</a></p>	<p>3) Problem Solving Lesson Structure: (CGI, 3 Phase, Math Workshop)  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>PD will provide an overview of planning a problem-based lesson using John Van De Walle's Three Phase Problem-Based Lesson Format. A video of a Three Phase Lesson will be shown if schools request a complete review. Grade level teams will then cognitively plan their own problem-based lesson using the same structure and using the LAUSD Curriculum Map &amp; an Alternative Math Task Clearing House. Finally teachers will rehearse the Before part of the lesson, receive in the moment feedback, and use data to discuss and refine the lesson.</p>
	<p>4) Observation of or Viewing Video of Planned Problem Solving Lesson  <b>2 hrs Bank Time + Staff</b>  <b>2 hrs (K-2 each)</b>  <b>2 hrs (3-5 each)</b></p>	<p>In this PD teachers will view a video of a colleague teaching the planned lesson or observe the teacher and then discuss the lesson using a protocol. The focus of the discussion will be on the data related to teacher questioning in eliciting and supporting student responses, analyzing the student work to inform instruction, and developing the academic language of mathematics. Teachers will then collaboratively make revisions to the lesson.</p>

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<p><b>Math Daily Instructional Routines (aka Number Talks)<sub>2</sub></b></p> <p>Teaching &amp; Learning Framework Connections: 1a1, 1a2, 1b1, 1d1, 1d4 3b1, 3b2, 3c1, 3d2, 3d3</p> <p>Math Shifts Connections: Focus Coherence Rigor</p> <p>Math Practice Connections: SMPs 1-8</p> <p>Special Population Connections: ELLs SWDs SELs</p>	<p>1) Number Strings + Follow-Up (K-5)</p> <p><b>2 hrs. Bank Time + Staff</b> <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers will be introduced to the math daily instructional routine of Number Strings which develops students capacity to identify and use number relationships and properties of operations to mentally solve math problems and build their math computational fluencies. In the follow up teachers will co-plan, co-rehearse, and debrief one Number String.</p>
	<p>2) Choral Counting + Follow-Up (K-5)</p> <p><b>2 hrs. Bank Time + Staff</b> <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers will be introduced to the math daily instructional routine of Choral Counting which develops students capacity to count in sequence, identify and reasons about number patterns, and apply computational strategies. In the follow up teachers will co-plan, co-rehearse, and debrief one Choral Count.</p>
	<p>3) Ways to Make a Number + Follow Up (K-5)</p> <p><b>2 hrs. Bank Time + Staff</b> <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers will be introduced to the math daily instructional routine of Ways to Make a Number which develops students capacity to compose and decompose numbers and thinking flexibly about numbers use place value, base ten and group strategies, and properties of operations. In the follow up teachers will co-plan, co-rehearse, and debrief one Ways to Make a Number.</p>
	<p>4) T/F &amp; Open Number Sentences + Follow-Up (1-5)</p> <p><b>2 hrs. Bank Time + Staff</b> <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers will be introduced to the math daily instructional routine of T/F and Open Number Sentences which develops students capacity to think relationally and fosters their reliance on fundamental mathematical properties when learning number facts, place value, and other basic arithmetic concepts. In the follow up teachers will co-plan, co-rehearse, and debrief one T/F or Open Number Sentence String.</p>

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<p><b>CCSSM Operation Problem Types &amp; Problem Strategies<sub>1</sub></b></p> <p>Teaching &amp; Learning Framework Connections:  <a href="#">1a1, 1a2, 1b1, 1d1, 1d4</a>  <a href="#">3b1, 3b2, 3c1, 3d2, 3d3</a></p> <p>Math Shifts Connections:  <a href="#">Focus</a>  <a href="#">Coherence</a>  <a href="#">Rigor</a></p> <p>Math Practice Connections:  <a href="#">SMPs 1-8</a></p> <p>Special Population Connections:  <a href="#">ELLs</a>  <a href="#">SWDs</a>  <a href="#">SELS</a></p>	<p>1) Addition &amp; Subtraction Problem Types &amp; Problem Strategies <b>(K-5)</b></p> <p><b>2 hrs. Bank Time + Staff</b>  <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers will be introduced through several interactive activities to the 11 addition and subtraction problem types and their number sentence representations included in the Operations and Algebraic Thinking Domain of the CCSSM. Teachers will also be introduced to the strategies that students use to solve these types of addition and subtraction problems along a developmental progression. CCSSM Content connections will be made to conclude this session.</p>
	<p>2) Representing Addition and Subtraction Problem Type with Singapore Bar Models <b>(K-5)</b>,</p> <p><b>2 hrs. Bank Time + Staff</b>  <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers learning about the addition and subtraction problem types will be expanded with an introduction to their Singapore Bar Model representations, which supports problem solving by supporting students' understanding of the mathematical relationships between quantities. Teachers will practice representing the addition &amp; subtraction problem types with bar models. Connections will also be made to the CA Math Framework &amp; AZ Learning Progression documents.</p>
	<p>3) Multiplication and Division Problem Types &amp; Problem Strategies <b>(2-5)</b></p> <p><b>2 hrs. Bank Time + Staff</b>  <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers will be introduced through several interactive activities to the 12 multiplication and division problem types and their number sentence representations included in the Operations and Algebraic Thinking Domain of the CCSSM. Teachers will also be introduced to the strategies that students use to solve these types of multiplication and division problems along a developmental progression. CCSSM Content connections will be made to conclude this session.</p>
	<p>4) Representing Multiplication and Division Problem Types with Singapore Bar Models <b>(2-5)</b></p> <p><b>2 hrs. Bank Time + Staff</b>  <b>2 hrs. +2 hrs. Follow Up</b></p>	<p>In this PD teachers learning about the multiplication and division problem types will be expanded with an introduction to their Singapore Bar Model representations, which supports problem solving by supporting students' understanding of the mathematical relationships between quantities. Teachers will practice representing the multiplication and division problem types with bar models. Connections will also be made to the CA Math Framework &amp; AZ Learning Progression documents.</p>

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<p><b>Early Numeracy Tools<sub>2</sub></b></p> <p>Teaching &amp; Learning Framework Connections:  <a href="#">1a1, 1a2, 1b1, 1d1, 1d4</a>  <a href="#">3b1, 3b2, 3c1, 3d2, 3d3</a></p> <p>Math Shifts Connections:  <a href="#">Focus</a>  <a href="#">Coherence</a>  <a href="#">Rigor</a></p> <p>Math Practice Connections:  <a href="#">SMPs 1-8</a></p> <p>Special Population Connections:  <a href="#">ELLs</a>  <a href="#">SWDs</a>  <a href="#">SELs</a></p>	<p><b>1) Ten Frames (K-2)</b></p> <p><b>2 hrs (K-2)+2 hrs (K-2) Follow Up</b></p>	<p>In this PD teachers will be provided with an overview/review of the ten frame as an early numeracy tool in addressing the CCSSM Content and Practice Standards in the K-2 grade span. Teachers will be exposed to warm-ups, lessons, and games. Moreover teachers will be provided all teaching instructions and materials needed to use these activities in their classroom. Furthermore teachers after co-planning with the math facilitator will in small groups rehearse a warm-up or lesson and receive in the moment support and feedback from the math facilitator. Finally connections will be made to the research base on early numeracy big ideas, landmarks, and strategies.</p>
	<p><b>2) Rekenreck or Arithmetic Rack (K-2)</b></p> <p><b>2 hrs (K-2)+2 hrs (K-2) Follow Up</b></p>	<p>In this PD teachers will be provided with an overview/review of the Rekenreck /Arithmetic Rack as an early numeracy tool in addressing the CCSSM Content and Practice Standards in the K-2 grade span. Teachers will be exposed to warm-ups, lessons, and games. Moreover teachers will be provided all teaching instructions and materials needed to use these activities in their classroom. Furthermore teachers after co-planning with the math facilitator will in small groups rehearse a warm-up or lesson and receive in the moment support and feedback from the math facilitator. Finally connections will be made to the research base on early numeracy big ideas, landmarks, and strategies.</p>
	<p><b>3) Number Grids/100's Chart + Follow Up (K-2)</b></p> <p><b>2 hrs (K-2)+2 hrs (K-2) Follow Up</b></p>	<p>In this PD teachers will be provided with an overview/review of number grids/100s chart as an early numeracy tool in addressing the CCSSM Content and Practice Standards in the K-2 grade. Teachers will be exposed to warm-ups, lessons, and games. Moreover teachers will be provided all teaching instructions and materials needed to use these activities in their classroom. Furthermore teachers after co-planning with the math facilitator will in small groups rehearse a warm-up or lesson and receive in the moment support and feedback from the math facilitator. Finally connections will be made to the research base on early numeracy big ideas, landmarks, and strategies.</p>
	<p><b>4) Number Lines (K-2)</b></p> <p><b>2 hrs (K-2)+2 hrs (K-2) Follow Up</b></p>	<p>In this PD teachers will be provided with an overview/review of the number line as an early numeracy tool in addressing the CCSSM Content and Practice Standards in the K-2 grade. Teachers will be exposed to warm-ups, lessons, and games. Moreover teachers will be provided all teaching instructions and materials needed to use these activities in their classroom. Furthermore teachers after co-planning with the math facilitator will in small groups rehearse a warm-up or lesson and receive in the moment support and feedback from the math facilitator. Finally connections will be made to the research base on early numeracy big ideas, landmarks, and strategies.</p>

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## Professional Development Learning Designs

PD Learning Designs	Description	Effectiveness
<p>Lesson Study Cycle (Implementation Phase) <b>2 days (1 for Planning Phase &amp; 1 for Research Lesson and Post-Lesson Activities)</b></p>	<div style="text-align: center;"> <h3>Lesson Study</h3> <pre> graph LR     subgraph Planning_Phase [Planning Phase]         P1([Discuss Long Term Goals for Students' Academic, Social and Ethical Development])         P2([Choose Content Area and Unit Discuss Learning Goals for Content Area, Unit and Lesson])         P3([Plan Lessons(s) that Foster Long-Term Goals and Lesson/Unit Goals])     end     subgraph Research_Lesson [RESEARCH LESSON]         RL([Actual classroom lesson; attending teachers study student thinking, learning, engagement, behavior, etc.])     end     subgraph Post_Lesson_Activities [Post-Lesson Activities]         PL1([Discussion of Lesson Discuss research lesson. Focus on evidence of whether the lesson promoted the long-term goals and lesson/unit goals])         PL2([Consolidate Learning Write report that includes lesson plan, data, and summary of discussion. Refine and re-teach the lesson if desired. Or select a new focus of study.])     end     P1 --&gt; RL     P2 --&gt; RL     P3 --&gt; RL     RL --&gt; PL1     PL1 --&gt; PL2             </pre> </div>	<p>Highly Effective (IES)</p>
<p>Grade Level PLCs (Implementation Phase) <b>(Ongoing and usually productive with 1-2 hrs)</b></p>	<p>Professional Learning Communities design units, lessons &amp; assessment, score and analyze student work, and implement new ideas based on learning of content and pedagogical knowledge for that particular grade and content area.</p>	<p>Highly Effective</p>
<p>Coaching Cycle (Introduction to New Teaching Ideas + Implementation Phase) <b>(1 Week or 2 Weeks)</b></p>	<p><b>Step 1:</b> Coach Models Then Coach &amp; Teacher Debrief  <b>Step 2:</b> Coach &amp; Teacher Co-Teach, Then Debrief  <b>Step 3:</b> Teacher Teachers &amp; Coach Observes, Then Coach &amp; Teacher Debrief</p>	<p>Effective</p>
<p>Bank Time + Staff Meeting PD (Introducing to New Teaching Idea) <b>(2 hrs)</b></p>	<p>Traditional Model of PD Delivery with Presentation of New Teaching Idea-Should be Content Focused, Interactive, and Modeling by Facilitator should occur.</p>	<p>Effective with Follow-Up Support Via PLC Work or Coaching or Lesson Study</p>



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## Research Base for ISIC Math Menu of Services

- "How to Get Students Talking" –Math Solutions
- "CBS: Communicating in the Math Classroom"-Ontario
- Center for Public Education: "***Teaching the Teachers: Effective Professional Development in an Era of High Stakes Accountability***"
- Supporting Implementation of the CCSSM: Recommendations for Professional Development-Friday Institute for Educational Innovation @ NC State
- NSDC's Report "***Professional Learning in the Learning Profession: A Status Report on Teacher Development in the United States and Abroad***" (*Darling-Hammond 2009*)
- NCTM Professional Development Brief: "Math Professional Development"
- IES US Department of Education: "Summary of Research on the effectiveness of math professional development approaches"
- 5 Practices for Orchestrating Productive Mathematics Discussions
- Number Sense Routines by Jennifer Shumway
- Number Talks By Sherry Parish
- Minilessons for Early Addition/Subtraction, Extending Addition/Subtraction, Early Multiplication/Division, Extending Multiplication/Division, Operations with Fractions, Decimals, and Percents by Cathy Fosnot et al.
- It Makes Sense: Using Ten Frames to Build Number Sense
- It Makes Sense: Using 100s Charts to Build Number Sense
- Elementary and Middle School Mathematics (6<sup>th</sup> Ed.) by John Van De Walle
- Children's Mathematic Thinking: Cognitively Guided Instruction
- Intentional Talk: How to Structure and Lead Productive Mathematical Discussions
- Common Core Standards in Diverse Classrooms: Essential Practices for Developing Academic Language & Disciplinary Literacy