Institute Objective

To improve mathematics instruction by providing district-level trainers with professional development resources focused on facilitating students' mathematical understanding through problem solving, communication, and reasoning.

Time	Notes	Materials
9:30-9:40	Introductions/Welcome/Agenda /Session Outcomes	PowerPoint
9:40-10:00	Task Sort Activity Purpose: Activate prior knowledge of analysis of rigor of tasks Thinking about your kids on a continuum, what is the rigor of each task? With a partner, read each task and determine if it is a low, medium, or high level task. Sort the tasks accordingly. Once completed, discuss your thoughts with your table group. As a group, come to a consensus on the level of the task. Write the number of the task of the task on a sticky note. Low-Yellow Medium-Pink High-Blue Pairs, Tables, Vote-Thumbs up, sideways, down from items on PowerPoint Discussion: Which task features did you use to decide how to rank the tasks?	Task Sort Cards in bags One slide per task Sticky notes- 3 colors
10:00-10:30	Triplet Tasks **Activate:** How do you choose the problems, tasks or projects that you plan for students to do? Mindstreaming: Partners: 45 sec Partner A Talks; Partner B Listens; 45 sec Partner B Talks; Partner A Listens. **Set Purpose**: The goal of this activity is for teachers to generalize the task selection planning process to any problem, task, or project. **Tools for Task Decisions** What are some key planning resources to use when selecting tasks? Share the VDOE 2009 SOL 7 Curriculum Framework (CF), the Task Analysis Guide (Stein & Smith, 2007) (TAG), and the Mathematical Process Goals (PG), and the Elements of Mathematical Proficiency (MP).	Triplet Tasks worksheet

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	Preliminary Task Analysis Participants will read tasks and individually and as a group check for alignment with the CF and evaluate for cognitive depth on the TAG based on descriptors. Share. **Task Completion** Teachers will solve tasks, using two different strategies or paths. Facilitators will ask teachers to describe the methods used to solve each task in writing. **Task Analysis** Table groups will share solution methods & strategies. Groups may post solution strategies.	
10:30-11:00	Making purposeful planning choices: Task analysis of features: ● Content Alignment ● Cognitive Depth ● Process Standards Use the highlighted documents to analyze the triplet tasks for content, cognitive depth and integration of process standards.	SOL Vertical fit (VDOE document) Virginia's Mathematical Process Goals for Students Task Analysis Guide from Stein, M. K., Smith, M. S., Henningsen, M. A., & Silver, E. A. (2009). Implementing standards-based mathematics instruction: A casebook for professional development (2nd Ed.). New York, NY: Teachers College Press.
11:00-11:15	Application Return to the original Task Sort and decide as a table group where each item would fit on the Task Analysis Guide based on the descriptors. Choose one task per table to modify for greater cognitive depth. Share with partner table in Task Exchange.	Task Sort Cards in bags Task Analysis Guide
11:15-11:40	Task Redo Where will I get these rich tasks? Example: before/after Modify one task of your choice from the task bank. How might your teacher teams modify their tasks to increase rigor? Share 3 examples on document camera.	Task Bank Document camera

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11:40-12:00	PD Design 1 dragon cartoon You are here as both a participant and a future trainer. What are the big ideas of the morning session? How could the big ideas of this morning shape your work this year? Designing PD for your district: Resources	Posted Resources
12:00-1:00	Lunch	

1:00-2:45
break: 2:15
	Video Case Study Overview
	Participants will experience a lesson cycle simulation with one task.
	Task Analysis
	The groups will begin by reading the task and thinking about what questions they would ask each other during planning.
	Questions would typically fall under alignment, cognitive depth, prerequisite skills and concepts, and predictions about student solution paths and misconceptions.
	   • Which solutions and strategies do you predict students will use?
	   • Write down all of the different solutions students might have.
	   • What misconceptions do you predict students might have with this concept?
	   • Write down key questions you will ask students to understand their thinking about this problem.
	Task Completion
	Participants do the task, recording their solutions and strategies.
	Explain your reasoning to a partner at a different table group.
	Task in Action
	Use the graphic organizer to look for evidence of the Mathematical Process Goals for Students in action on this classroom. Assign each table one standard to look for.
	Problem Solving, Reasoning, Communication, Connections, Representations
	Watch video, recording evidence of targeted process standards.
	One Stray: One rep moves around tables (2 min.) Share your evidence from the video of teacher and student moves that show the process standards in action.
	Evidence of Learning
		Video: *Building Rafts with Rods*
		http://www.learner.org/resources/series33.html?pop=yes&pid=924
		Build Rafts with Rods, from Teaching Math: A Video Library (5-8/9-12) used with permission by Annenberg Learner. www.learner.org
		
		Building Rafts with Rods Teacher Directions
		Proportional length rods (10 of each color per group)
		Questions in a Bag Activity
		Student work samples
		Document Camera

Time	Notes	Materials
	Cards in a Bag Activity	
	Analyze student work samples for evidence of understanding. Compare the evidence to your predictions for solutions, strategies and misconceptions.	
	What were all of the different solutions that students generated?	
	Which strategies did they use to solve the task?	
	Which misconceptions did students have? Compare these to your predictions.	
	How did representations help students understand the mathematics? What evidence do you have that students connecting between different representations?	
	How did students communicate their reasoning to other students and to the teacher?	
	How does the student work show evidence of differentiation?	
	How would you use this evidence to inform the next instructional decisions for these students (choose one or more students)?	
	Reflection:	
	What is the value of collaboratively examining student work?	
	(whole group conversation)	
2:45-3:00	Division Level Professional Development	3-2-1 card
	Share task banks for SOL 6, 7, 8. Review all resources and access location for use in division professional development.	
	3-2-1 Reflection	
	Reflect on your next 3 action steps related to this training. Identify 2 key people you will need to speak with. Think of 1 question for which you will want to find out more information.	