

Problem Solving and Effective Teaching Practices (Hybrid)

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COURSE PURPOSE

The purpose of this course is to build teachers' understanding of the cognitive processes in problem solving, equip teachers with effective mathematics teaching practices to uncover and expand students' mathematical thinking and disposition, and foster student-centered, discourse-rich learning environment.

Meetings *(Note: in person meetings may change to virtual meetings based on the health guidelines.)*

- Six in-person meetings at RESA 8:30 - 3:30
- Virtual small group meetings
- Coaching meetings: Two coaching cycles, virtual & in person meetings, classroom visits

LEARNER OUTCOMES:

1. *Knowledge:* Participants will gain an understanding of the cognitive processes in problem solving, common problem types and strategies students use, ways to transform tasks to promote reasoning, as well as the progression of learning in Numbers in Base Ten (NBT) and Operations & Algebraic Thinking.
2. *Practice:* Teachers will become familiar with and implement Effective Mathematics Teaching Practices (*NCTM, 2014*) to promote Standards for Mathematical Practices in their classrooms.
3. *Participants will learn to:*
 - ☐ Implement Effective Mathematics Teaching Practices.
 - ☐ Facilitate meaningful classroom discourse centered around problem solving
 - ☐ Design/Select problems according to their mathematical demands and recognize student responses in terms of cognitive development and disposition.
 - ☐ Pose purposeful questions to develop students' ability to reason with numbers, contextual problems, and to communicate mathematically.
 - ☐ Promote and connect students' meaningful use of mathematical representations (contextual, physical, visual, verbal, and symbolic).
 - ☐ Represent students' mathematical thinking in algebraic expressions and equations.

BOOKS

Taking Actions: Implementing Effective Mathematics Teaching Practices in Grades K-5 (Provided)
Children's Mathematics: Cognitively Guided Instruction

GRADES 2-3 MEETING DATES AND TOPICS

Date	Session Topics/Assignments	Assignment Due
Sept. 9, 2020 8:30-3:30	Session 1. Introduction to Problem Solving: Cognitive Process, Tasks, and Facilitation Virtual Session Recording	Pre-course survey

	• Cognitive processes involved in problem solving • Common problem types and strategy development • Numeracy & problem solving progression • Cognitively Guided Instruction, 3-Act Tasks, and other models that promote reasoning and problem solving Assignment: Complete Reflection #1. Collect student work samples from the selected lesson	
Ooc. 7, 2020 8:30-3:30	Session 2. Delving into Students' Thinking & Strategies Progression, Representation, & Connection • Strategies students use to solve problems • Mathematical principles & properties • Representing students' thinking • 5 Practices for Orchestrating Productive Mathematics <i>Discussions:</i> Anticipating, Monitoring, Selecting, Sequencing, and Connecting Assignment: Use the anticipation chart. Collect student work and teacher recording. Complete Reflection #2.	Reflection #1 Bring: Class Set of student work samples Read: Ch.1-3
Nov. 4, 2020 8:30-3:30	Session 3. Breathing Inquiry into the Classroom; Purposeful Problems, Purposeful Questioning, Productive Discourse • Posing Questions for Teaching and Learning • Eliciting Evidence of Student Thinking • Transforming tasks • Representations and mathematical communication • Algebraically Transferrable Mathematical Communication Assignment: Transformed Task, Anticipation chart, Reflection 3: Questions and Discourse Student work samples	Reflection #2 Bring: anticipation chart, Ss work samples, and T recordings Read: Assigned chapters
<i>Coaching Cycle Begins</i>		
Jan. 13, 2021 8:30-3:30	Session 4. Building Procedural Fluency from Conceptual Understanding • Fluency in whole number, fractions, and measurement • From problem solving to procedural fluency • Use and connect multiple representations • Developing Strategic Fluency • Exposure, Experience, and Expectation Assignment: Complete the problem based lesson assignment. Collect all artifacts. Complete reflection #4	Reflection #3 Problem based Micro-teaching lesson plan Bring: Ss work samples & T recordings
<i>Coaching Cycle Continued</i>		

Feb. 10, 2021 8:30-3:30	Session 5. Putting It All Together (SMP & MTP) • 3 D's of the Cognitively Active Classroom • Taking Action: Connecting SMP and MTP	Final Reflection Bring: Class set of student work samples (post)
<i>Coaching Cycle Continued</i>		
Mar. 3, 2021 8:30-3:30	Session 6. Reflecting Back, Moving Forward • Final Reflection Presentation and Celebration	Final Reflection Bring: Class set of student work samples (post)

How This Course is Assessed

Northeast Georgia RESA uses the Guskey model to evaluate courses offered. This class will use 5 levels of evaluation.

Level 1- Participants' reactions

Level 2- Participants' learning

Level 3- Organization Support and Change

Level 4- Participants' Use of New Knowledge and Skills

Level 5- Student Learning Outcomes



PL Feedback

PL Feedback
Ticket Out the Door
Work Samples

Coaching Cycle
Follow-up session
Observations &
Feedback
References

Coaching Cycle
Instructional
Observation &
feedback

Progress Tracker
Student Work
Samples
Performance
Tasks & Rubrics