Math in Context® Resources & Strategies for Effective Implementation

Course 4, 8th Grade Focus

This course is designed for teachers using Encyclopædia Britannica's Mathematics in Context® (MiC) and who want to make the most of the curriculum and, in particular, the problem solving prompts. After completing the six-week course participants will be familiar with the general format of MiC teacher resources, including Mathematics in Context® Problems of the Week (MiCPoWs–problems taken directly from the MiC student texts) and also how to make the most of the problem solving process with students in their classrooms.

Goals

We hope this course helps you:

- learn more about the teacher resources provided with each MiC unit.
- develop concepts of mathematical problem solving and communication, both your own and your students'.
- learn about the Math Forum's problem solving and mathematical communication activities and how to use them with the MiCPoWs.
- learn more about assessing student work and providing effective feedback.
- expand your toolkit of strategies for managing problem solving in your classroom.
- participate in an ongoing community of teachers using MiC and MiCPoWs.

Course Requirements

Participants enrolled in this course are expected to have:

- MiC curriculum materials
  - *Looking at an Angle*
  - *Great Predictions*
  - *Algebra Rules!*
- access to Mathematics in Context® Online
- access to Britannica Online®
- work with students who use this curriculum
- Internet-accessible computer

Introduction:

Participants will have some flexibility within each week but are expected to complete the activities during each assigned week. Participants who successfully complete the course activities will receive a Certificate of Completion from the Drexel University School of Education indicating they have completed 15 hours (1.5 CEUs) of Professional Development. For Pennsylvania residents we are also able to provide Act 48 credit.

Requirements:

Most assignments can be completed anytime during the assigned week. Generally, the deadline for each week's assignments will be 10 pm (eastern time) on Wednesday nights. Occasionally some assignments will have a different deadline. Those will be noted in the weekly overview.

Contributions to the Discussions should be thoughtful and add something of value to the topic. Our approach is to

1. value everyone's contributions as we all share our explorations and wonderings.
2. ask and answer questions of ourselves and others.
3. think of how this can transfer to our classrooms.

Participants are welcome to request an online chat with the instructor and/or arrange a chat time to have with other participants.

Weekly Schedule

Week 1: Teacher Resources
Focus:

- *The text and online teacher resources provided with each MiC unit.*

Objectives:

- Become oriented to the Blackboard Vista environment (only an Internet connection and Web browser are required).
- Introduce yourself and become acquainted with the other course participants.
- Become oriented to the MiC text and online teacher resources.
- Discuss what you notice and wonder about the teacher resources with other participants.
- Solve and post a solution to a MiCPoW from *Looking at an Angle*.
- Contribute to the discussions.

Week 2: Problem Solving and Communication
Focus:

- *The nature of good communication in problem solving and the teacher's role in facilitating it.*

Objectives:

- Notice and discuss to specific information provided in the MiC teacher resources.
- Identify and discuss the mathematics addressed in MiCPoW.
- Examine and discuss activities to help facilitate students' understanding of a problem.
- Read *Understanding the Problem* from the Math Forum's *Problem Solving and Communication Activity Series*.
- Reflect on the reading with relation to the MiCPoW.
- Increase understanding of what good problem solvers do and what good communication in problem solving is.

Week 3: Representation
Focus:

- *Representations (physical objects, drawings, charts, graphs, and symbols) help students communicate their thinking.*
- *Variety of classroom implementations.*

Objectives:

- Share ideas of different representations students might use to solve another MiCPoW from *Looking at an Angle*.

- Explore Java applets linked from Mathematics in Context® Online.
- Notice and discuss MiC teacher text and online resources.
- Present MiCPoW in classroom.
- Have students draft MiCPoW solutions on paper.
- Share stories of classroom experiences (possibly share samples of student work).

Week 4: Responding
Focus:
- *Using the Math Forum's problem solving process to respond to your students with just "I notice" and "I wonder" statements.*
- *Exploring ways to maximize problem solving discussions in the classroom.*

Objectives:.
- Reflect on and discuss the value of responding to students' problem solving communication.
- Explore ways to develop student's ability to justify their thinking.
- Explore the Math Forum's Ask Dr. Math site as a resource
    - of mathematics information.
    - to provide variety in thinking about a student's mathematical question.
- Practice responding using "noticing" and "wondering" statements.
- Share ideas for managing problem solving in the classroom.
- Share stories of students' reactions to your "I notice" and "I wonder" statements.

Week 5: Connections
Focus:
- *The mathematical ideas presented in our mathematics classes should interconnect and build on one another to produce a coherent whole.*
- *The goal is not to be over and done. The goal is to think, reflect, revise, and master.*

Objectives:
- Explore the text and online teacher resources for *Great Predictions* or *Algebra Rules!.*
- Identify standard information that is provided and how it can help you prepare your classroom interactions.
- Individually solve and submit to a MiCPoW from *Great Predictions* or *Algebra Rules!*.
- Present MiCPoW in classroom.
- [optional] Set up student accounts and have students submit MiCPoW solutions online.
- Continue to notice and discuss MiC teacher text resources

Week 6: Making the Most of MiC
Focus:
- *Be aware of the resources available to you.*
- *Now that you know more about what is available, what are your questions?*
- *As part of the Math Forum MiCPoW Community, how can you stay connected?*

Objectives:
- Revisit all of the different resources you have the ability to access
- What do you notice now? What are you still wondering about?
- Consider how to use the "*onlineMiCcourse*" discussion to continue having contact with your new MiC online course friends.
- Consider how to make the most of using a growing collection of MiCPoW resources with your students.

Readings
Title: *Looking at an Angle*

Author: Britannica: Mathematics in Context
Edition/Year: 2006

Title: *Great Predictions*
Author: Britannica: Mathematics in Context
Edition/Year: 2006

Title: *Algebra Rules!*
Author: Britannica: Mathematics in Context
Edition/Year: 2006

Title: *Problem Solving and Communication Activity Series: Understanding the Problem*
Author: The Math Forum
Additional information: The PDF is linked from the weekly readings assignment pages. The link is also available from Web Links under Course Tools.

Recommended Resources
Title: *Dr. Math® Gets You Ready for Algebra*
Author: The Math Forum
Publisher: John Wiley & Sons
The book is a series of questions and answers arranged according to a standard math pre-algebra class, and supplemented with Internet references and a glossary.
Available here: http://mathforum.org/pubs/dr.mathbooks.html

Title: *Dr. Math® Explains Algebra*
Author: The Math Forum
Publisher: John Wiley & Sons
The book is a series of questions and answers arranged according to a standard Algebra I class, and supplemented with Internet references and a glossary.
Available here: http://mathforum.org/pubs/dr.mathbooks.html

Title: *Principles and Standards for School Mathematics*
Author: National Council of Teachers of Mathematics (NCTM)
Edition/Year: 2000
Additional information: If you are not an NCTM member and do not have access to the print form of this document, you can sign up for 120-day free online access to the full Principles and Standards at NCTM's website.