PoW Class Membership: Resources & Strategies for Effective Implementation

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This course is designed for current subscribers of the Problems of the Week who want to make the most of their membership. After completing the six-week course participants will be familiar with all of the new resources features as well as being introduced to all of the resources associated with your PoW membership access. You will be able to make an informed decision about how to start implementing PoWs with your students, and you'll have an idea of further steps to try when you are ready. Our problem solving process that we've been developing since 1993, can be compared to the writing process. We encourage problem solvers to:

- read the problem
- get started
- carry out a strategy
- draft a solution and explanation
- reflect
- get feedback
- revise

Goals

We hope this course helps you:

- learn more about the resources provided with each of the Math Forum's Problems of the Week (PoWs) and how they can help you enhance student competence and confidence in problem solving and communication.
- develop concepts of mathematical problem solving and communication, both your own and your students'.
- enhance your understanding of NCTM's Process Standards and the role of PoWs in addressing them.
- 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 PoWs.

Course Requirements

Participants enrolled in this course are expected to have:

- PoW Class Membership (or higher)
- Internet-accessible computer

Introduction:

Participants will have some flexibility within each week but are expected to complete the activities during the 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.

Weekly Schedule

Week 1: Problem Solving
Focus:

- *Problem solving as a vehicle for teaching and learning mathematics.*

Objectives:

- Become oriented to the Epsilen environment (only an Internet connection and Web browser are required).
- Introduce yourself and become acquainted with the other course participants.
- Become oriented to the PoW areas of the Math Forum.
- Individually solve and submit to the current PreAlgPoW.
- Increase understanding of what good problem solvers do.

Week 2: Communication
Focus:

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

Objectives:

- Revise PreAlgPoW submission.
- Increase understanding of good communication in problem solving.
- Examine samples of student work from our archive of actual student submissions to this PreAlgPoW.
- Examine suggestions of how to facilitate students' reflection and revision of their work.
- Practice thinking in terms of “I notice…” and “I wonder…” to encourage students to reflect and revise.

Week 3: Representation
Focus:

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

Objectives:

- Be aware of the ongoing PoW schedule and available resources.
- Share ideas of different representations students might use.
- Use “Print this Problem” feature.
- Present PreAlgPoW in classroom.
- Have students draft PreAlgPoW solutions on paper.

- Have some students submit solutions online (minimum of 3 students or groups of students).

Week 4: Reasoning and Proof, Responding, Managing
Focus:
- *Using the Math Forum's PoW office functionality to respond to your students with just "I notice" and "I wonder" statements.*
- *Exploring ways to make the most of the PoW office functionality to maximize problem solving discussions in the classroom.*

Objectives:
- Become oriented to My PoW Work to view student work
- Have students use their Message Centers and their My PoWs page.
- Reflect on and discuss the role of reasoning at your grade level.
- Explore ways to develop student's ability to justify their thinking.
- Continue to think in terms of "I notice" and "I wonder."
- Share ideas for managing problem solving in the classroom.

Week 5: Connections and Reflections
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:
- Try something that someone else described as you introduce the next PoW (FunPoW, PreAlgPoW, AlgPoW, GeoPoW or LibraryPoW) to your students.
- Have students draft their solutions.
- Have students submit solutions.
- Use the "I notice…" and "I wonder…" method to provide feedback to your students.
- Have students check their Message Centers to read, reflect and revise.
- Have students leave a Comment noting a reflection.

Week 6: Making the Most of Your PoW Membership
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 PoW Community, how can you stay connected?*

Objectives:
- Revisit all of the different resources you have the ability to access with your Class Membership.
- Visit and explore the Problems Library.
- Visit and explore Write Math.
- Consider how to use the "*onlinePDcourse*" discussion to continue having contact with your new PoW course friends.
- Consider how to use the "pow-teachers" discussion to strengthen the Math Forum PoW Community.

Readings

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. This document will be used throughout the course.

Title: *Problem Solving and Communication Activity Series: Program Description & Introduction*
Author: The Math Forum
Additional information: PDFs of these are linked from the weekly readings assignment pages. They are also available from Web Links under Course Tools.

Title: *Problem Solving and Communication Activity Series*
Author: The Math Forum
Additional information: PDFs of these are linked from the weekly readings assignment pages. They are also available from Web Links under Course Tools.

Title: *Enhanced Problem Packet for Teachers*
Author: The Math Forum
Additional information: PDFs of these are linked from the weekly readings assignment pages. The link to the index page of them 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