Problem Solving and Communication Activity Series
http://mathforum.org/pow/support/activityseries/

Are you looking for ways to help your students become more confident problem solvers? To help students move beyond “I don’t get it”? To teach specific problem-solving strategies?

The Math Forum’s new Problem Solving and Communication Activity Series can be used with the Problems of the Week (PoWs) to help students develop, formalize, and reflect on their problem-solving strategies. We also focus on enhancing students’ mathematical communication skills as they write to learn, communicate, and present.

Each document in the Activity Series highlights a problem-solving strategy in developmental sequence and provides focused small-group or partner explorations to help introduce each strategy. Each document includes student handouts to support students as they work through the activities. In addition, for the current PoWs as well as each of last year’s PoWs, we have written problem-specific examples of how the highlighted strategy and activities might support problem solvers.

**Round 0: Introducing the Activity Series**
What do good problem-solvers do? How does communicating help with problem solving?

**Rounds 1 and 2: Understanding the Problem**
What do I notice about the problem? What do I wonder? Can I say it in my own words? Can I say it a different way?

**Round 3: Guess and Check**
What quantities could I make a guess for? What calculations could I do? How can I check my guess? And how can I organize my work to make good guesses and see patterns in my calculations?

**Round 4: Solve a Simpler Problem**
What makes this problem hard? What can I change to make it simpler?

**Round 5: Making a Table**
What needs to be organized? How can I organize it to help me see patterns?

**Rounds 6 through 9 repeat Rounds 2 through 5**

**Round 10: Cases**
What are the objects or situations in this problem? What kinds of cases do they come in? Examples of different kinds of cases are provided.

**Round 11: Logical Reasoning**
What must be true? What might be true? What can’t be true?

**Round 12: Change the Representation**
What are the main ideas in this problem? What are other ways to express them? Examples of different mathematical representation are provided.

**Round 13: Make a Mathematical Model**
What are the quantities in this problem? How can I write the relationships between them? Can I build those relationships into a model? Or can I think of the big picture and break it down into a complete model?

**Round 14: Working Backwards**
What’s happening? What must have happened before that?

**Round 15: Planning and Reflecting**
What information do I have? What strategies could I use? How do I step back if I get stuck? And what can I learn from communicating my plan at each stage?

**Round 16: Getting Unstuck**
What is going on in this problem? What can I try? What does this remind me of? Why isn’t this working? What am I missing? Do I need more ideas? Do I need help?

**Round 17: Play**
Play with the information provided in the problem and possible strategies. Several playful activities are provided.

**Rounds 18 and 19 repeat Rounds 12 and 13**

**Round 20: Wondering**
What am I missing? How does this fit with what I learned before? What am I trying to figure out, again? And much, much more…

—I used the Noticing/Wondering strategy again. I love it! It really gets the students engaged and they feel that they can contribute, especially since there isn’t any pressure to have a right answer.” —Delaware middle school teacher

“I really like the schedule of rounds provided. Understanding the problem is exactly where we need to start. Students often miss what is being asked. Round 1 and 2 are excellent places to begin.” —New Jersey middle school teacher
Problems of the Week
Membership Options
as of May 2010, memberships go through June 2011

Class Membership
Price: $119 Primary grade band; $149 other grade bands; per class (up to 36 students); reduced rates available for schools/districts
  • Access to four Current Problems of the Week
  • Access to sections of the Problems Library and grade bands of Write Math with the Math Forum (WMMF) as follows:
    - Primary (K-3): Primary and Math Fundamentals segments of the Problems Library, and WMMF grades K-3
    - Elementary (3-6): Math Fundamentals and Pre-Algebra segments of the Problems Library, and WMMF grades 3-6
    - Mid-Level (5-8): Math Fundamentals, Pre-Algebra, and Algebra segments of the Problems Library, and WMMF grades 5-8
    - Secondary (9-12): Pre-Algebra, Algebra, and Geometry segments of the Problems Library, and WMMF grades 9-12
  • Students may submit online
  • Access to teacher resources, including activities from the Problem Solving and Communication Activity Series, Enhanced Problem Packets, Online Resources, and problem solutions
  • Register up to 36 students per class
  • Assess your own students’ responses using our online mentoring and feedback system
  • Eligible for free mentoring in Current PoWs when available
  • Priority Mentoring available for $10 per student per problem, up to 100 students ($5/student/problem for > 100 students; available at time of purchase or call us to add later)
  • Eligible to purchase online professional development course that provides an in-depth introduction to using the Problems of the Week ("Teaching Math with the Problems of the Week")

School and District Memberships
Price: call 1-800-756-7823, option 1, to inquire; discounted rates based on number of students
Same features as Class Membership, with the addition of...
  • Introductory on-site, online, or phone-based professional development included
  • Online professional development courses at discounted group rates
  • Local mentor development: the Math Forum will offer training and support for designated local mentors
  • Supports coherent improvement efforts; aligns with state and national standards; offers practice for constructed-response assessments

Teacher Membership (Individual)
Price: $25
  • Access to the four Current Problems of the Week (see Class Membership for Problems Library Access)
  • Teacher submission for Current PoWs (for student submission, see Class Membership); eligible for free mentoring when available
  • Teachers may print copies of the problems to distribute to students
  • Access to teacher resources, including activities from the Problem Solving and Communication Activity Series, Enhanced Problem Packets, Online Resources, and problem solutions

Student Membership (Individual)
Price: $15
  • Access to the four Current Problems of the Week
  • Online submission; eligible for free mentoring when available
  • Priority mentoring for $10/problem additional fee (add with purchase, or call to add later)

Trial Account (Explore the Class Membership)
Price: Free
  • 21 days of access to the four Current Problems of the Week
  • Access to the Problems Library or Write Math with the Math Forum—up to five problems viewed by either the teacher or students
  • Class account allows teacher to register up to 36 students
  • Students may submit to any of those five problems or the Current Problems of the Week
  • Access to the Teacher Office to monitor and mentor your students’ work
  • If free mentoring is available for one of the Current Problems your students submit to, they’re eligible to receive feedback