



# PoWs in the Classroom

What might using the Problems of the Week in your classroom look like? Here are some step-by-step suggestions to consider.

## Step 0: Read and Understand the Problem

Use appropriate literacy strategies to make sure the problem is understood and new vocabulary words are learned.

## Step 1: Brainstorming

[Whole class or as an away activity] Brainstorm ideas about how to solve the problem, make notes, do calculations, write down facts and definitions that were researched. If doing it as an away activity, students might talk with a partner or within a group about ideas.

## Step 2: Figure Out a Solution Strategy

[Individual and then partners or class] Students develop their approaches to the problem. Over time introduce students to the different methods on the Problem Solving Strategies List. It may help students to discuss their solution strategy with a partner or the class in order to develop it enough to write a draft and to see if it makes sense. The goal is to help all students get to the point where they are ready to write drafts. They should not try to make all solutions agree or be the same, if they even get that far at this step.

## Step 3: First Draft

[Center or partner activity] Explain what you have been able to figure out. If you are stuck, explain up to that point and then try to ask a specific question for what you need help with. Write complete sentences. Remember to explain why each step was taken. Talk and share with a partner or submit this online to the Math Forum in order to receive help.

## Step 4: Revision

[Center or partner activity] Discuss with the teacher or a partner the feedback you received on your solution. Use the rubric to think about all of the aspects of a good solution. Make notes on what to improve. Revise the draft.

## Step 5: Submission

[Individual] Submit online, or to the teacher

## Step 6: Repeat steps 4 and 5 if there is time

Notes: Each step could be done a different day, or some could be combined. The first couple of times, write a class solution on the class data pad (so that it can be revised). Progress to the point where students are working independently and with partners. Feel free to modify this process so that it looks like the writing process in literacy.

**<http://mathforum.org/pow/support/process.html>**



# The PoW Scoring Rubric

What's important in a PoW solution? What are the different elements of problem solving that are considered? What does a clear and complete solution look like?

We look for good problem solving and strong mathematical communication when reading submissions to our Problems of the Week. Solutions should include enough information to help another student understand the steps taken to solve the problem and the decisions made in the process.

Submissions are scored using the following categories:

## Problem Solving

- Interpretation: Interpret the problem correctly and attempt to solve all of the parts.
- Strategy: Pick a good strategy and apply it well, achieve success through skill instead of luck.
- Accuracy: Get the calculations and details correct, including writing correct statements and equations.

## Communication

- Completeness: Explain all the steps taken to solve the problem.
- Clarity: Explain the steps in such a way that a fellow student would understand, and make an effort to check formatting, vocabulary, and spelling.
- Reflection: Check the answer, reflect on its reasonableness, summarize the process, and connect it to prior knowledge and experience.

Submissions are scored using four levels of performance:

- Novice: Just starting out
- Apprentice: On the right track, but not quite there
- Practitioner: Got it
- Expert: Wow! Above expectations in some way

## Scoring Grids

General versions of the grid are available for each of our services, which can be accessed from the main page of each service.

Math Forum mentors, volunteers, and Teacher Members who choose to mentor their own students' solutions use problem-specific scoring guidelines to help them apply the rubric as consistently as possible.

A grid like the one shown on the right is used by mentors when viewing an individual submission. The "scores" are then automatically pasted into the reply to the student (and can easily be removed if desired) and are available to teachers when managing student work.

	novice	apprentice	practitioner	expert
<b>Problem Solving</b>				
interpretation	☺	☺	☺	☺
strategy	☺	☺	☺	☺
accuracy	☺	☺	☺	☺
<b>Communication</b>				
completeness	☺	☺	☺	☺
clarity	☺	☺	☺	☺
reflection	☺	☺	☺	☺

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