

Lesson Flow: Teaching Through Problem-solving

| Lesson Phase | Activity and Purpose |
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| <p>Introduction and Posing the Task (brief)</p> | <p>Teacher poses the problem. Students grasp it, become interested in solving it, and recall related ideas.</p> |
| <p>Independent Problem-Solving (7-20 min)</p> | <p>Students bring their own prior knowledge to bear, trying to solve the problem. There may be input from classmates after students work for a few minutes on their own, but students are individually exerting effort to come up with a solution approach. Students are not simply following the teacher's solution. Teacher circulates, noting student solution methods on a seating chart for teacher's reference during next phase of the lesson. Teacher may question some students (e.g., "What is the problem asking?" to struggling students; "Can you write an equation to go with your diagram?" to students who think they are finished).</p> |
| <p>Presentation and Class Discussion of Students' Solution Approaches; this phase is orchestrated by teacher's <i>neriage</i> ("kneading" or "polishing" discussion) (15-30 min)</p> | <p>Teacher designates several students to present their work on the blackboard and explain it. Choice and sequence of the student work is planned by teacher in order to support development of the important mathematical understandings. (Incorrect approaches are sometimes included in the presentations.) Class members actively study the solutions, supported by teacher questions such as "How many solved it this way?" and "Do you agree with this method?" Students contrast solutions, supported by teacher questions, such as "What is the same and different about Sam's and Marika's solutions?" and "What are the good points and difficulties of each solution method?" Discussion focuses on the thinking and</p> |



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| | reasoning used in problem solving and the central mathematical ideas. |
| Lesson Summary and Consolidation of Knowledge; may include assessment task (brief) | Teacher draws on student thinking to summarize what has been learned (usually on blackboard). Students use the blackboard record and math journals to organize, reflect on, and consolidate their thinking. Class often ends with a journal writing prompt such as “What I learned today.” |

