

After students have participated in the program long enough to become familiar with problem-solving strategies, ask, "Which strategy might be useful in solving this problem?" Accept suggestions and prepare students to experiment and assess the effectiveness of their suggestions. Assist students if they have difficulty suggesting a strategy. Strategies that could be suggested include:

Restate the problem In Your Own Words.

What information is given in the problem?

What are the conditions?

What are you asked to find?

Trial and Error

Use All Given and Implied Information

Solve Part of the Problem

Draw a Diagram

Make a List or Make a Chart

Search for a Pattern

Solve a Simpler Problem

Work Backwards

Allow and encourage students to use strategies other than those suggested in the hints. It is unreasonable to assume that there is one best strategy that each person should use in solving a particular problem. The objective is to encourage students to develop their abilities to use a variety of strategies.

Solving the Problem:

When students begin solving the problem, encourage them to work together in small groups (up to four members per group). Group work reduces pressure on individuals and some students are more willing to take risks in small groups than they are in whole-class situations. Challenging problems can generate many questions; students assist each other with their questions. Thus, small-group work reduces the number of questions the teacher has to deal with, and it provides students an enhanced learning environment in which they evaluate their own thinking as they present, justify, and question ideas.

Assist students with hints and specific questions as needed or requested. Providing just the right amount of assistance at the right time is a teaching skill that develops with time. Strategy-directed hints follow the main problem in each set and one or more of the looking back questions in each problem set. Sometimes simply directing students to look at these hints provides enough assistance. Although some students are satisfied that they are making progress, others need reassurance that the problem can be solved and that the hints are useful. The teacher's recognition of and praise for students' persistence builds perseverance.

Before the whole class review begins, individuals frequently ask the teacher whether their solution is "right." Simply answering "yes" can end the attention span of an answer-oriented student. Ask those students to check their work with others in their small group. Students who finish early can attempt looking back questions.

Reviewing the Solution:

Reviewing the solution is one of the most important aspects of learning problem-solving skills. During the review be certain to emphasize **How** the problem was solved and the **Names** of the problem-solving strategies that were useful in the solution process.

Arrange for a student, a small group of students, or a couple of students from different groups to write their solutions on the chalkboard just before the review begins. Students present their own solutions to classmates. The teacher assists by emphasizing the names and uses of the strategies, asking for alternate solutions, and clarifying as needed.

Students can benefit from exposure to alternate solutions to the same problem, but the process must be managed well to hold the interest of the class. Focus on the differences between the alternate solutions,