

# Tips For Creating a Classroom of Problem Solvers

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## **Teach Problem Solving Skills Directly:**

Look for opportunities to teach these skills. Give detailed examples of each skill throughout the year. Use the basic outline of the process as a flowchart for having students check their own work.

### Read the Problem and Think About the Situation:

- o Identify the facts.
- o Identify the question.
- o Visualize the situation.
- o See the action and the setting.

### Explore the Information and Make a Plan for Using It:

- o Organize the information.
- o Is there enough information?
- o Is there too much information?
- o Can I draw or construct a model?
- o Can I make a chart, a table, a graph, or a drawing.

### Select a Strategy to solve the problem:

- o Pattern recognition
- o Guess and check
- o Make a systematic list
- o Act it out
- o Draw a picture
- o Work a simpler problem
- o Work backwards
- o Write an equation
- o Make a table

### Find an answer to the problem:

- o Estimate.
- o Use computational skills.
- o Use algebraic skills.
- o Use geometric skills.
- o Use tools such as a calculator.

### Reflect on your answer and extend your response:

- o Check your answer-
  - Is the question answered?
  - Is the answer reasonable?
  - How does your answer compare with your estimate?
- o Are there alternate solutions to this problem?
- o Ask "what if" questions.
- o Discuss your solution in writing.
- o Are there patterns or mathematical concepts at work in this problem?
- o Can you create variations of this problem?
- o Do other problem solvers agree with your solution?

## **Provide Many Opportunities for Students to Use Their Problem Solving Strategies**

- o Calendar Math
- o Problem of the Day
- o Math Journals
- o Math Center
- o Problem Solving lessons
- o Chapter Investigations
- o Workshop pages
- o Math World

## **Create a Classroom Atmosphere in which Creativity and Problem Solving Can Happen**

- o Set an example by solving problems and by sharing these experiences with the pupils.
- o Reduce anxiety by encouraging communication and cooperation. On frequent occasions problems might be investigated using a whole group approach or by having the students work in small groups.
- o Encourage students in their efforts to solve problems by indicating that their strategies are worth trying and by giving them sufficient time to investigate the problem. Stress the value of the process rather than the exact answer.
- o Use pupil's ideas (and mistakes) when solving problems and planning lessons.
- o Ask higher level questions:
  - I wonder if....
  - Do you suppose that.....
  - What happens if...
  - How could we find out....
  - Is it possible that...
  - What might be another way to....
  - How is that like....
  - How is that different from....
  - Can we generalize....
- o Reinforce the asking of probing questions by students as they search for increased understanding. If instruction is successful, questions such as, "What should I do now?," will be addressed by the learner and not by the teacher.
- o Don't be afraid of "birdwalking" into other areas of the curriculum. Making connections is essential to the understanding of mathematics in the real world.

## **Connect Math to Everything!**