

variety of possible problem-solving situations.

The development in students of this body of knowledge (the stages, strategies and skills of problem solving) represents the major purpose or goal of problem-solving instruction. However, these elements need to be routinely

and carefully *integrated* with daily instruction, not taught as a separate program. Problem-solving instruction needs to be integrated because it simply does not stand on its own — it has no purpose in and of itself. Its purpose is found in its application to given and real life tasks.

Writing Activities

In the Mathematics Classroom

Writing in the mathematics classroom is a topic which has gained increasing support and interest over the past decade. Writing and learning mathematics seem to go together naturally. Writing about ideas while learning mathematics seems to add a dose of purpose both to the learning of mathematics and to the process of learning how to write.

The very act of writing forces the writer to think carefully about his or her topic, and may even serve a metacognitive function by asking the writer to reflect on his or her own understanding of concepts. At the same time it provides a variety of legitimate activities that allow students to practise important writing skills.

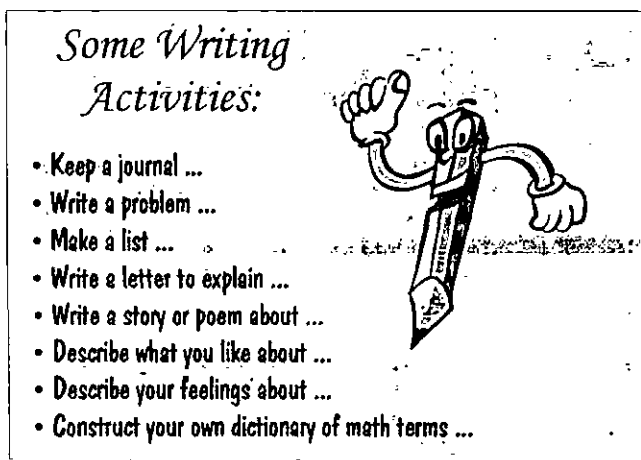
In short, students need to learn how to communicate both orally and in writing and,

furthermore, they need to learn how to communicate mathematical ideas. There is no place in our school curriculum in which writing activities cannot be included, and there is no grade prior to which we can say writing activities are inappropriate. How much easier the writing and communicating process will appear to our students if it has been regularized and emphasized at all stages of the learning

process in all subject areas. The question becomes, what types of writing activities are possible and appropriate in our classrooms at the earliest grades?

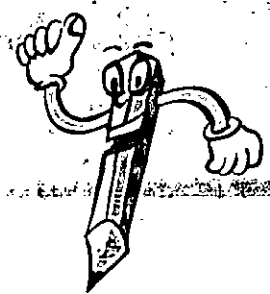
Many authors have written about the various kinds of writing activities which can be

integrated with the study of mathematics. Some ideas are provided in the inset on the previous page. But most writing activities seem to fall in one of two categories: *reflective* writing and



Some Writing Activities:

- Keep a journal ...
- Write a problem ...
- Make a list ...
- Write a letter to explain ...
- Write a story or poem about ...
- Describe what you like about ...
- Describe your feelings about ...
- Construct your own dictionary of math terms ...



creative writing.

In reflective writing we ask students to contemplate their own understanding of mathematical ideas and write about the things that they understand and the things that confuse them. We may ask students to describe what they think something means or what a symbol stands for. We might even ask students to talk generally about their experiences of learning mathematics, such as their enjoyment of, or frustration with, math class.

“Why” questions work well to encourage students to display their understanding or the meanings they have built, as in

**Why do $5+4$ and $6+3$
have the same sum?**

Other questions that focus on having the students define terms and key ideas also help in the assessment of student learning, for example,

**In your own words,
what is a pattern?**

Students could also be asked to apply their understandings to a specific task, such as

**Describe how you could
tell if two shapes have
the same area.**

Creative writing can also be used to probe students’ understandings of mathematical ideas, but such questions tend to add a fun twist. For example, we could ask students to generate a story or poem.

**Write a story telling
about something a
crazy cat did each day
for a week.**

We could also ask students to construct problems for others to solve.

**Write a riddle for your
classmates to solve!
Make a list of 5 clues
describing an object in
your classroom. Ask a
friend to solve your
riddle.**

In summary, we have attempted to define two different, though non-distinct, types of writing activities: *reflective* (which includes meaning-based questions, definition questions, and application tasks) and *creative* (which includes problem-posing activities and a variety of other activities, such as writing stories and poems).