Developing Computational Fluency in Addition and Subtraction

Archived Information

Kathy Ernst

An appropriate motto for a Japanese teacher would be, “structured problem solving.”

In the United States, the motto is, “learning terms and practicing procedures.”

James W. Stigler and James Hiebert, The Teaching Gap: Best ideas from the World’s Teachers for Improving Education in the Classroom (New York, NT: The Free Press, 1999

OVERHEAD #3

When children *invent* procedures, they construct *understanding* of mathematics.

A Good Problem Solver Is…

- **CURIOUS…..Wonder about things, ask questions, explore to find out more!**
- **FLEXIBLE…..Look for different ways to solve a problem.**
- **PERSISTENT…..Don't give up easily. Take time to think and keep on trying.**
- **A RISK TAKER…..Try new or challenging things. Don’t be afraid to make mistakes—they are learning opportunities!**
- **REFLECTIVE…..Take time to think about what you're doing, why you're doing it, whether it makes sense, and how you can do it better.**

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Guidelines for Problem-Solving

- Help each other do your best thinking.
- Give help or a hint *only* if the learner wants it. (Would you like help; a hint?)
- Help the learner discover solutions and mistakes. (How did you get that? Show me how you figured it out.)
- If you disagree with someone's solution or method, ask him how he got it. If you still disagree, tell him why. Politely explain your own thinking.

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Computational Fluency

EFFICIENCY

ACCURACY

FLEXIBILITY

Susan Jo Russell, *Relearning to Teach Arithmetic: Addition and Subtraction*. (Parsippany, NJ: Dale Seymour Publications, 1999).

On Saturday, I walked in the park and saw 39 tulips blooming. On Sunday I saw 54 more tulips blooming. How many tulips did I see in bloom?

After the rainstorm, I saw 100 earthworms on the sidewalk. At recess, I saw only 67 worms. How many worms disappeared?

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I was on the 28th floor of a very tall building in New York City. I went on the elevator and got out at the 72nd floor. How many floors did I travel on the elevator?