Creating a Problem-Solving Culture

Henri Picciotto

www.MathEducationPage.org henri@MathEducationPage.org blog.MathEducationPage.org

The key challenge

Any group of kids is heterogeneous

Alliance with the strongest Support for the weakest



Racers vs. Diggers



What about the others?



Access and challenge can coexist



Sample Problem

Arrange the whole numbers from 1 to 18 into nine pairs, so that the sum of the numbers in each pair is a perfect square.

Think

Arrange the whole numbers from 1 to 18 into nine pairs, so that the sum of the numbers in each pair is a perfect square.

What makes this a decent problem?

Honing the Question

Arrange the whole numbers from 1 to 18 into nine pairs, so that the sum of the numbers in each pair is a perfect square.

Arrange the whole numbers from 1 to 18 into nine pairs, so that the sum of the numbers in as many pairs as possible is a perfect square.

Generalizations

Find some numbers other than 18 for which this is possible.

Find many such numbers.

Find all such numbers.

etc.

Shaping the Culture

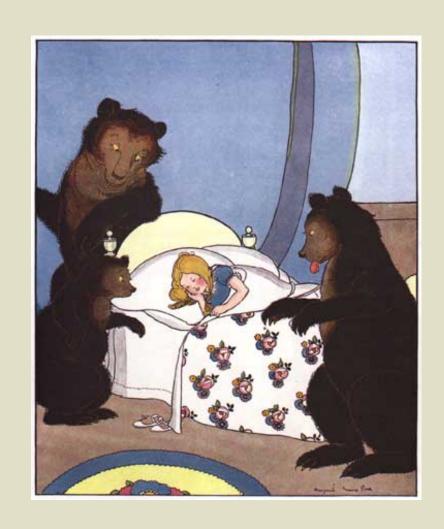
The Elevator Strategy



Stop on all the floors!

Every day...

- ♦ Something too difficult
- ♦ Something too easy
- ♦ Something "just right"



Possible Structure

- I.Think
- 2. Pairs or groups of four
- 3. Whole-class discussion
- 4. Repeat

Group Work

- ♦ Random groups
- ♦ Students mostly work independently
 - are expected to help each other
- ♦ If a group does not function well
 - intervene directly to get the behaviors you want
- ♦ If more than one group is stuck
 - stop them all for a class discussion

Verbalizing

Putting things in words is crucial to understanding

- ♦ Encourage talking
- ♦ Require writing

Don't answer questions they don't have

They cannot hear you!

- ♦ Seed with questions, problems, discussion
- ♦ Lecture in small doses when appropriate

Creating a safe environment

- ♦ No putdowns
- ♦ "Tell your neighbor..."
- ♦ "Can you restate what X said?"

Praise participation and risk-taking

- rather than correct answers

Handling wrong answers

- write down many answers
- ♦ poker face vs. telling
- ♦ "Choose someone to help you"
- ♦ make 'mistakes' yourself

Feedback from all

votes

gestures

writing

Nothing Works

for every student

every group

every teacher

every day

There is no one way



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