

Helping Students Develop
Mathematical Habits of Mind without
Compromising Key Concepts from the Syllabus

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Panel

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Terminology for: The things mathematicians DO

Mathematical -

- Habits of Mind (Cuoco, Goldenberg, Mark)
 - Ways of Thinking (Harel)
 - Dispositions
 - Sensibilities
 - Practices (Bass, Ball)

Examples of Mathematical Practices

- Ask “natural” questions
- Explore and experiment
- Represent (in many ways)
- Seek patterns or structure
- Consult – literature, experts.
- Connect
- Use mathematical language with care & precision
- Seek proofs
- Be opportunistic
- Prove
- Analyze proofs
- Generalize
- Exercise aesthetic sensibility & taste

How can instruction cultivate these practices while responsibly treating the basic curriculum?

My Claims

- It is possible
- It can, and must, start very early
- More than individual student performance, it is about developing the whole class, as an intellectual collective
- The knowledge and skills demanded of the teacher are considerable, but they can be learned, with proper support
- The student learning of basic skills is enhanced, not compromised by such instruction

A third grade class - mid-year

Problem

Gum costs 2¢ and pretzels cost 7¢. If you have 30¢ and want to spend it all on gum and pretzels, how many pretzels could you possibly buy?

Discover even and odd numbers. Explore them. Speculate about them, and their arithmetic.

Bernadette's Conjecture

$$\text{Odd} + \text{odd} = \text{Even}$$





