



# Elementary Mathematics: The Symbiosis of Content and Pedagogy

Anne Marie Condike  
K-5 Math Coordinator  
Westford Public Schools

The background of the slide is a solid orange color with several large, stylized leaves in shades of brown and darker orange scattered across it. The leaves have prominent veins and are arranged in a way that suggests a natural, autumnal setting.

**“I was never any good at math!”**

# Observations of Elementary Teachers

Many teachers...

- Are math phobic
- Lack self-confidence in mathematics
- Are more comfortable teaching procedural skills than conceptual understanding

# Observations of Elementary Teachers

Many teachers...

- Don't know what they don't know
- Lack an understanding of the developmental stages of mathematical skills and concepts as they progress across grade levels.

# Observations of Elementary Teachers

Many teachers....

- Do not understand how mathematical concepts connect to each other
- Are reluctant to take math courses

# Professional Development in Westford to Address Teacher Preparedness in Mathematics

- University of Westford Courses
  - Number Sense & Operations
  - Patterns & Algebraic Reasoning
  - Geometry

# Extensive training in content & pedagogy

- Skill development
- Conceptual understanding
- Connections
- Communication
- Progression of skills and concepts across grade levels

# Message to Teachers

- You can't teach what you don't know.
- You can't know what you didn't learn.

# Addressing Teacher Confidence

It's not that you weren't good in math, it's that you were not provided the appropriate learning experiences to acquire the knowledge.

# Mathematics Courses for Elementary Teachers

- Need to provide a combination of content and pedagogy
- Should provide not only an in-depth study of mathematical concepts, but also the progression of these concepts throughout the various grade levels

# Mathematics Courses for Elementary Teachers

- Must utilize many of the same instructional methodologies that we expect teachers to employ with children
- Need to provide learning experiences that incorporate hands-on activities

# Mathematics Courses for Elementary Teachers

- Should foster inquiry-based learning
- Must incorporate mathematical connections between concepts, standards, and strands of mathematics

# Results

Teachers gain confidence in their mathematical abilities

Teachers gain a deep understanding of mathematical concepts

Teachers gain a deep understanding of how mathematical concepts connect to each other

- Teachers gain a respect for “teaching for understanding” rather than relying solely on procedural skill development
- Teachers gain a deep understanding of the development of mathematical skills and concepts across grade levels