

# Pre-Service Teacher Preparation

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# Presentation Outline



- My Role in the Standards Revision Process
- ELED Program Overview
- Math Education Sequence
  - MATH 341: Math Concepts for Teachers I
  - MATH 342: Math Concepts for Teachers II
  - ELED 330: K-8 Math Methods
  - ELED 495: Math Clinic Practicum



# My Role in the Standards Revision Process

- Provided meta-analyses for group to review prior to revisions
  - Alignment of K-8 Mathematics Interventions with **Strands of Mathematical Proficiency** in Meta-Analytic Research (Pulles & Burns, 2022)
  - A Meta-Analytic Review of the **Concrete-Representational-Abstract** Math Approach (Ebner et al., 2025)
  - A Meta-Analysis of **Schema Instruction** on the Problem-Solving Performance of Elementary School Students (Peltier & Vannest, 2017)
  - The Effectiveness of **Direct Instruction** Curricula: A Meta-Analysis of a Half Century of Research (Stockard et al., 2018)
- Worked in the 6<sup>th</sup>-8<sup>th</sup> grade group to revise content standards
- Provided feedback on the draft standards progression document and standards revisions based on public comments



# ELED Program Overview

## Year 1

- General Ed.
- Education Core
  
- EDFN 102  
Observation

## Year 2

- Content
- Education Core
  
- ELED 296
  - 2-Day  
Observation

## Year 3

- Methods
- Education Core
  
- Embedded  
Courses
- ELED 396
  - 30 Hours
  - 1 Lesson
- Reading Clinic

## Year 4

- Methods
- Education Core
  
- ELED 496
  - 60 Hours
  - 2 Lessons
- Math Clinic
- Student  
Teaching
  - 12 Weeks



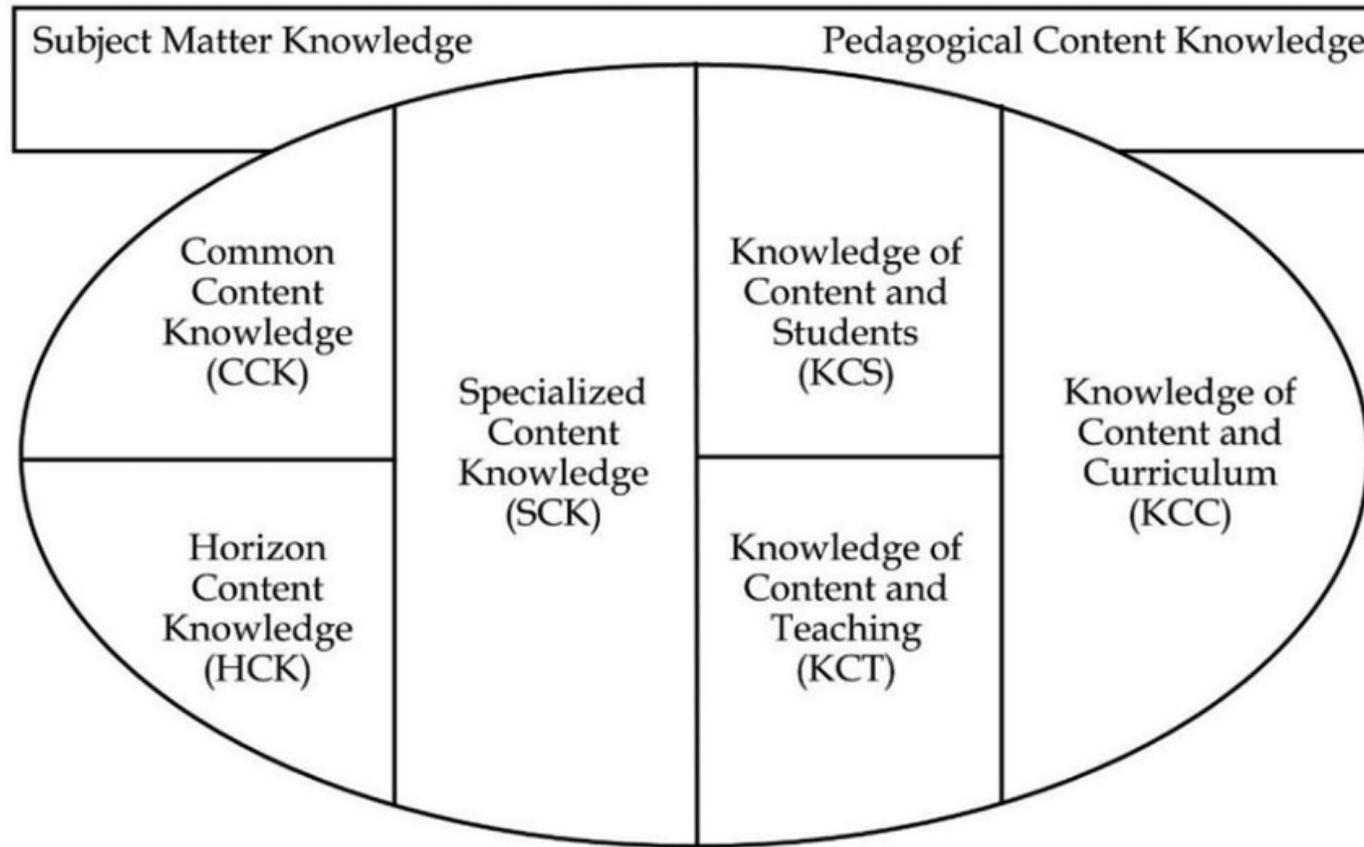
# Math Education Sequence

MATH 341

MATH 342

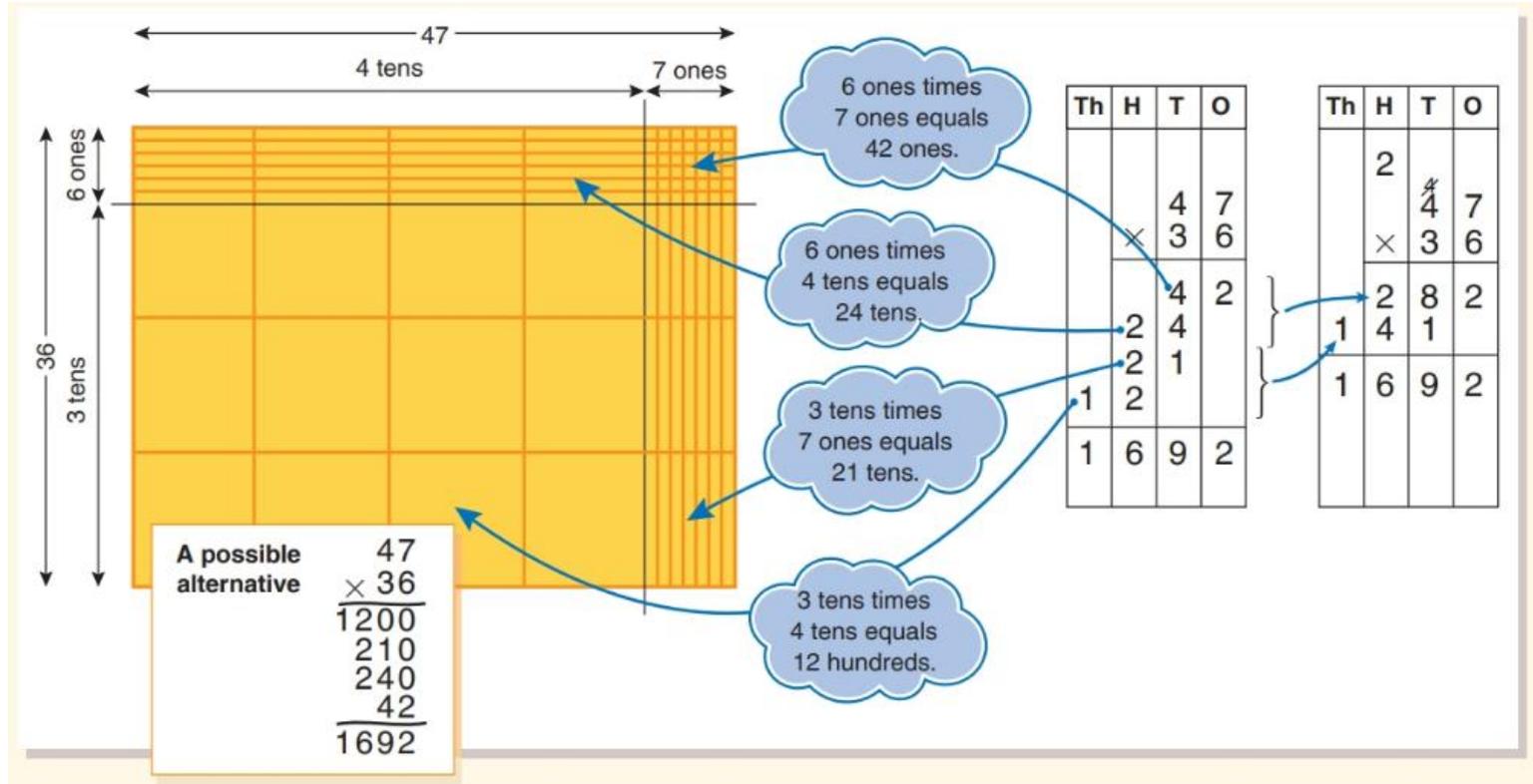
ELED 330

ELED 495



# MATH 341 Math Concepts for Teachers I

- The Number System
- Operations
  - Addition
  - Subtraction
  - Multiplication
  - Division
- Number Theory
- Algebraic Thinking



# MATH 342 Math Concepts for Teachers II

- Statistics
- Probability
- Geometric Figures
- Geometric Measurement
- Geometric Movement



$$3 \times V_{\text{cone}} = V_{\text{cylinder}}$$

$$V_{\text{cone}} = \frac{1}{3} V_{\text{cylinder}} = \frac{1}{3} Bh$$

# ELED 330 K-8 Math Methods

- Theory (5 weeks)
  - Mathematical Knowledge for Teaching Framework
  - Concrete, Representational, Abstract (CRA) Sequence
  - Schema Instruction
  - Strands of Mathematical Proficiency
  - Mathematical Task Analysis Guide
  - Explicit Instruction & Inquiry-Based Learning
  - The van Hiele Model
- Practice (11 weeks)
  - Interpreting content standards
    - One week for each grade
  - Concept progression
    - Operations
    - Fact fluency
    - Geometric thinking
  - CRA demonstrations
    - K-2 concept
    - 3-5 concept
    - 6-8 concept
  - 60-hour field experience



# ELED 495 Math Clinic Practicum

- One-on-one, after-school tutoring program
- Explicit, CRA instruction
- SDSS-M alignment
  - 3<sup>rd</sup>-6<sup>th</sup> grade standards
- Fraction unit
  - Equivalent fractions
  - Comparing fractions
  - Fraction operations
  - Algorithms



# References

- Ebner, S., MacDonald, M. K., Grekov, P., & Aspiranti, K. B. (2025). A meta-analytic review of the concrete-representational-abstract math approach. *Learning Disabilities Research & Practice, 40*(1), 31-42. <https://doi.org/10.1177/09388982241292299>
- Peltier, C., & Vannest, K. J. (2017). A meta-analysis of schema instruction on the problem-solving performance of elementary school students. *Review of Educational Research, 87*(5), 899-920. <https://doi.org/10.3102/0034654317720163>
- Pulles, S. M., & Burns, M. K. (2022). Alignment of K-8 mathematics interventions with strands of mathematical proficiency in meta-analytic research. *Psychology in the Schools, 59*(6), 1192-1208. <https://doi.org/10.1002/pits.22676>
- Stockard, J., Wood, T. W., Coughlin, C., & Rasplica Khoury, C. (2018). The effectiveness of direct instruction curricula: A meta-analysis of a half century of research. *Review of Educational Research, 88*(4), 479-507. <https://doi.org/10.3102/0034654317751919>

