Transition to Algebra Dialogues

Research-Based Strategies for Strengthening Written and Verbal Communication in Mathematics

MassMATE

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Transition to Algebra

- Full-year algebra-support curriculum with student & teacher materials that supports the Common Core Standards for Mathematical Practice
- Uses mathematical puzzles and read-aloud dialogues to encourage collaborative problem solving and use of precise mathematical language

Algebraic Habits of Mind

- Puzzling and Persevering
- Seeking and Using Structure
- Using Tools Strategically
- Describing Repeated Reasoning
- Communicating with Precision

- Goal: For students to become *producers*—not just consumers—of mathematical language

A Simple Problem

If  = , then what number(s) can the  represent?

Dialogues

- Model mathematical discussion
- Address common misunderstandings
- Encourage academic and mathematical language
- Students can:
  - Read them out loud in small groups
  - Act them out in front of the class
  - Record and edit videos their mathematical readings
  - Create dialogues to describe their own solving process

Who Am I? Puzzles

Who Am I?

- I am a 4-digit number.
- I am greater than 5000.
- k is my only odd digit.
- t is a square number.
- $tu = h$
- None of my digits are the same.
- The product of my digits is not 0.
- $t + 1 = k$

k	h	t	u

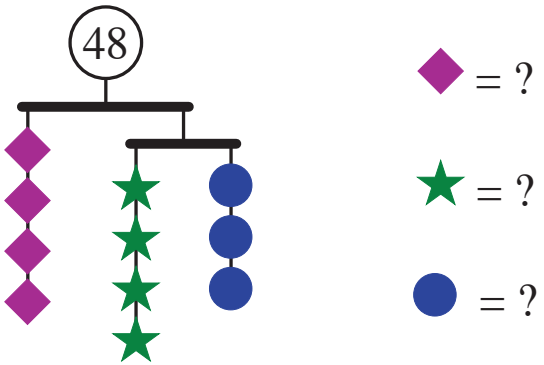
Who Am I? Puzzles

Make clues with relevant content:

- place value
- parity: evens and odds
- inequalities
- squares and roots
- multiples
- primes
- divisibility
- factors
- GCD & LCM
- algebraic expressions
- factoring (ex: $t + u = 12$ and $tu = 36$)

Why Puzzles?

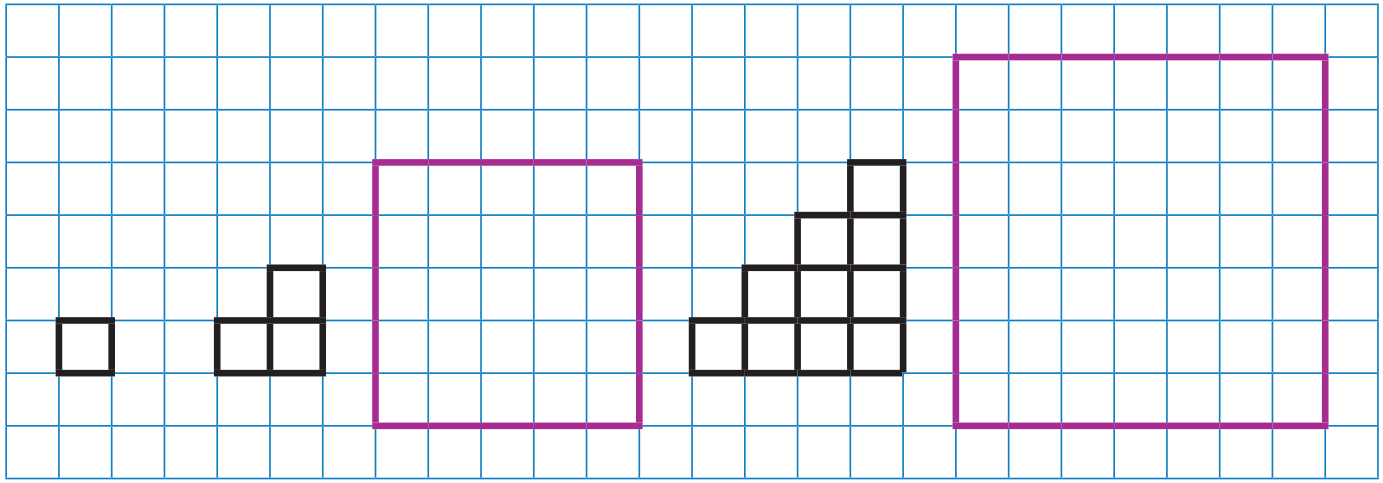
Mathematical Puzzles:



- are genuine problems
- support number sense
- encourage logical reasoning
- help students develop strategy in problem solving
- are fun and engaging
- promote constructive collaboration
- encourage perseverance

Exploration

Observe this growing staircase pattern, and fill in the missing stages.



Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

Write a dialogue about students discovering an expression for the number of squares in a Stage n staircase.

Transition to Algebra

transition to algebra

make algebra make sense

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For for information: transitiontoalgebra.com or mfries@edc.org