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Cultivating Mathematical Habits of Mind in All Students

Baltimore STEM Smart, March 22, 2013

Agenda

- Introduction
- Supporting the Transition to Algebra
- Mathematical Habits of Mind
- Hands-on Experience with Classroom Materials
- Small-group Discussion
- Group Sharing

Supporting the Transition to Algebra

- TTA, a 4-year R&D project funded by NSF
- Full-year intervention course to be taken concurrently with first-year algebra
- Also used in other settings including summer school and middle school as pre-algebra
- Related projects: Implementing the Mathematical Practice Standards and iPuzzle

Habits of Mind Approach

- Quickly giving students the mathematical knowledge, skill, and confidence to succeed in a first-year algebra class
- Focus on a few key mathematical ways of thinking or mathematical habits of mind
- Important algebra topics are used as contexts for fostering these mathematical practices

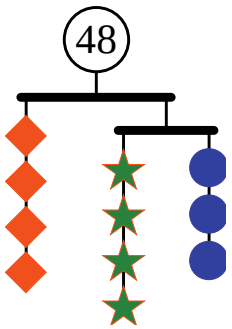
Transition to Algebra Habits of Mind

- Puzzling and Persevering
- Seeking and Using Structure
- Using Tools Strategically
- Describing Repeated Reasoning
- Communicating with Precision
- Consistent with Common Core State Standards for Mathematical Practice

Why Puzzles?

- Building career skills: problem solving when the **solution method may not be known** before starting; puzzles also **allow for social collabo**ration in solving
- Accessible logical thinking activities: puzzle **difficulty can vary independently along two dimensions**—prerequisite mathematical skill and cognitive demand

Exploring Puzzles…



◆ = ?

★ = ?

● = ?

4★ = 3●

4◆ = 4★ + 3●

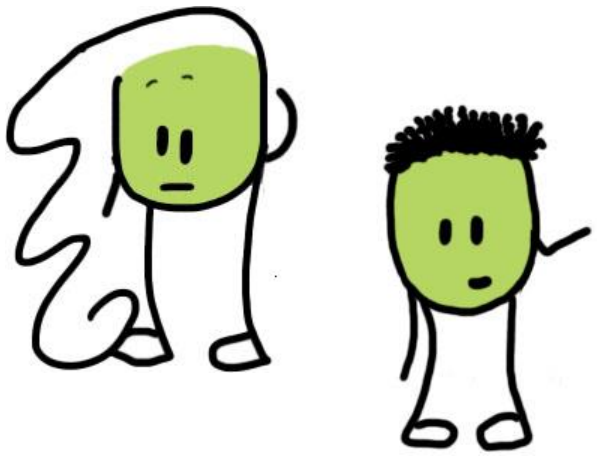
48 = 4◆ + 4★ + 3●

MysteryGrid a, a^2, a^3, a^4

a^6, •			$2a^4+a^3$,+
a^7, •	a^4, •		
		a^5, •	
	a^7, •		

Discussion

- What can you, in your school context, do to increase opportunity for all students to experience intellectually engaging content without requiring prerequisite knowledge?



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