



## The 2016 WPU Algebra Institute

### *Supporting the Development of Algebraic Thinking*

[Target audience: 3rd – 8th Grade Teachers]

**10/14/16 9:00 AM - 4:00 PM**

William Paterson University  
1600 Valley Road, NJ 07470

This year's conference will deepen your understanding of how to select mathematics tasks and apps that have the potential to be high in cognitive demand and encourage algebraic thinking. Participants will also learn how to keep the cognitive demand high during implementation and encourage the use of manipulatives as a tool to make sense of ideas and engage in algebraic reasoning.

**8:30 am – 9:00 am: Registration, Breakfast**

#### Workshop I: 9:00 am – 10:30 am

##### **Visual Approaches to Understanding Algebra**

*By Dr. Sandra Alon, William Paterson University*

In this workshop, participants will engage in methods that are kinesthetic to teach and learn Algebraic processes and reinforce conceptual understanding. Participants will use manipulatives (hands on tools) to provide physical representations of abstract concepts. Activities will help lay the foundation for developing abstract algebraic thinking whereby they will interact with algebra to “see and feel” what is happening.

**10:30 am – 10:40 am: Break**

#### Workshop II: Part 1: 10:40 am – 12:00 pm

##### **Cognitive Demand and Algebraic Thinking: Part 1**

*By Dr. Lisa Warner, William Paterson University*

Stein, Smith, Henningsen & Silver (2009) emphasize the importance of providing students with opportunities to solve high cognitive demand tasks. Such tasks are often complex, and may involve multiple solutions, representations, and justifications; some of which may be unanticipated or not easily understood by teachers as they occur in the classroom. Participants will explore a high cognitive demand task, with a focus on algebraic thinking, in particular, patterns, generalization and justifications. Participants will also discuss the implications of teachers' actions on students' mathematical activity when faced with cognitively challenging tasks. Strategies will be shared that help teachers become more

comfortable with the complexities of classroom situations and deal with “in the moment” decisions that support students’ algebraic reasoning.

**12:00 pm – 12:40 pm: Lunch**

**Workshop II: Part 2: 12:40 pm – 1:25 pm**

**Cognitive Demand and Algebraic Thinking: Part 2**

*By Dr. Lisa Warner, William Paterson University*

Participants will discuss the implications of teachers’ actions on students’ mathematical activity when faced with cognitively challenging tasks. Strategies will be shared that help teachers become more comfortable with the complexities of classroom situations and deal with “in the moment” decisions that support students’ algebraic reasoning.

**1:25 pm – 1:30 pm: Break**

**Workshop III: 1:30 – 3:00 pm**

**Choosing apps with high pedagogical, mathematical and cognitive fidelity for teaching Algebra**

*By Dr. Heejung An, William Paterson University*

In this workshop, the participants will examine and analyze how mathematics apps commonly available for K-8 classrooms can enable genuine mathematical thinking to develop, as based on constructs of pedagogical, mathematical, and cognitive fidelity. Workshop activities will involve analyzing the apps for pedagogical and mathematical fidelity by using the code framework developed by Bos (2009) and the four levels of cognitive demand (Stein, Smith, Henningsen & Silver, 2009).

**3:00 pm – 3:10 pm: Break**

**Teacher Panel: 3:10 – 4:00 pm**

*By Jennifer Hales, Memorial Middle School*

*Stephanie Parisi, James Caldwell High School*

*Justin Perinotti, Lafayette School*

*Nevin Werner, Roosevelt Elementary School*

Elementary, middle school and high school teachers will discuss the development of students’ algebraic thinking in their classrooms.

- **Participants will receive 7 Professional Development Hours**
- **Fee:** \$79
- **Contact information:** Alma Diaz, [diaz6@wpunj.edu](mailto:diaz6@wpunj.edu)
- **Registration:** <https://wpconnect.wpunj.edu/continuing-education/programs/The-2016-WPU-Algebra-Institute-82316/33754/>